

## CONJUGATE GRADIENT BACKPROPAGATION IMPLEMENTED ON OBSTACLE AVOIDANCE WHEEL ROBOT IN WEBOTS®

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### ABSTRACT

*Conjugate Gradient BackPropagation (CGBP) is one of backpropagation method which have complexity higher than Gradient Descent BackPropagation. We tried implemented on our wheel robot to avoid obstacles because there are still no many researcher using this method to their artificial intelligence systems. They told us about the complexity of building this method. We thought that one control systems which have more complexity than a famous one, would be have a better performance. We hoped this method could handle a blank spot of training of Neural Network which most of the people got the same problem with blank spot training. This wheel robot have 3 sonar sensors, and 2 motors. This robot realized in Webots simulator environment which completed all physics conditions so we can build many obstacles on it like a real world implemented. We train the robot without a cylindric shape obstacle. For running process, we provided with 2 conditions, without an obstacle and with some obstacles. The result is successful about 100% to get wall follower action without any an obstacle. And without got a training with some an obstacles before, we got the results about 50% success. This conclude that CGBP still can not handle the blank spot of training, and it must to train with an obstacles to get the better successful.*

**Keywords:** Obstacle Avoidance robot, Neural Network, Conjugate Gradient BackPropagation, Webots®.